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them, which consisted of bread crumbs, "garden bugs", and some of the "marsh bugs" before mentioned.

On March 19, I took both captives again to the marsh for photographs. On the way from the car to the spot selected, a gnat lit on my companion's finger and upon holding the Black Rail near, she grabbed greedily at the insect. She seemed rather vicious at all times, pecking angrily at anything offered her—sticks, fingers and all. A small, round clump of salicornia, perhaps three feet in diameter, was selected for the background effect, and operations began. The little rail proved the more elusive of the two. She would dive into the dense mass, exactly as a duck dives in water, and would then crouch motionless, as if hiding. The walking positions of the two species were noticeably different. The little Black was always proud, with head erect and no jerky movements while walking, but the Carolina was a typical rail, head down, tail erect, and forever sneaking off sideways as though he were ashamed of himself. Finally on March 20, after making what pictures I wanted, I turned the two rails free to roam and search for food and mate at will.

Many times later, I searched in vain for the hidden, speckled beauties which the little black mother probably had hidden away somewhere under a sheltering marsh clump, but I never found them. Let us trust they hatched safely into fuzzy youngsters, and were led by their mother through the protecting marsh growth down to the feeding grounds in the muddy beds of tidal streams. If such was the case you may be sure she warned them to look out, at all times, for that fellow who would poke sticks at them as he once had at her, to arouse the spirits of a crestfallen captive into photographic sprightliness.

San Diego, California, December 13, 1915.

THE NUTCRACKERS OF YELLOWSTONE PARK

By M. P. SKINNER

THE CLARKE Nutcracker, or Clarke Crow (*Nucifraga columbiana*), is sometimes known as "Camp Robber", possibly because of the rather superficial resemblance it bears to the true camp robber or Rocky Mountain Jay. But his livery is black and white and gray as against the various tones of gray alone, as shown by the jay. In the Yellowstone Park the nutcrackers are everywhere; but where they occur in the large, open prairies and meadows, it is evident that they are only flying across between the heavy evergreen forests. They are never seen in the large flocks reported elsewhere, but are usually found in one's or two's, or perhaps in small flocks of a half dozen. The largest flock reported was made up loosely of twenty-four individuals. While not migratory birds, strictly speaking, they do move up and down the mountains at the change of the seasons. In summer they are at all elevations, but in winter they are all below 7000 feet. One snowy, stormy day they were observed in numbers passing the top of Mt. Sheridan at an elevation of 10,000 feet. The vicinity of Mammoth Hot Springs and Fort Yellowstone seems to be a center of abundance both winter and summer. A careful estimate gives from twenty to thirty birds as constantly in this neighborhood; but as this bird

is an erratic wanderer at best, this number is greatly exceeded at times. No doubt it is the large supply of pinyon cones together with kitchen scraps that draws them here.

Nutcrackers will eat anything. They forage about the stables for grain, come to the kitchen doors for scraps, especially pieces of meat and bones; in the mountain wilds they pick out the seeds of pine cones, eat cedar berries, and devour large numbers of insects. They have even been seen to catch their prey on the wing, making very flycatcher-like sallies from the tip of a tall pine. Sometimes they walk over the ground like crows, searching for ants and ground insects. But the nutcracker really seems to prefer pine seeds, especially those from the pinyon pine. Sometimes they will tear the cone to pieces even while the cone is still fast to the branch, often perched at the very tip of a bending branch, or even underneath, clinging in a manner creditable to a chickadee or a nuthatch. More often the cone is detached and carried away to a strong limb where it is held by one foot while the bird strikes strong, downward blows at it with its pickax-like bill. At times the bird will secure a seed at every second stroke and at the same time tear the cone to shreds. Being bold, independent free-lances these birds will vary their methods by robbing a pine squirrel of his cone; even going so far as to knock the squirrel from his limb with one blow from their bills at the end of a long, swift swoop. The pine squirrel knows this, too; and it is delicious to see the squirrel, whose own abilities as a robber are not small, glide into some protection and hurl vituperation at his enemies. Nor are the nutcrackers at all backward at "sassing" back. Many a time the somber, evergreen forests are enlivened by such a squawking match, joined in by all the squirrels and nutcrackers in hearing.

The nutcrackers do not restrict themselves to the troubles of their own species. On one occasion two Mountain Blue-birds had a "little difference" near the writer; and while they were hard at it, the nutcrackers commenced to collect until there were four about, each trying to mix in. One nutcracker became so excited that in rising from the ground he struck a nearby wire gate and knocked out several feathers and partially stunned himself. Nor is their pugnacity confined to small birds. Let a hawk appear and he is mobbed by all the nutcrackers in sight, as well as by all within hearing of the squawking birds. They usually attack a hawk from above, striking it between the shoulders; the hawk tries to escape by circling up until he leads his tormentors so high that they are forced to raise the siege and return to terra firma. Occasionally the hawk will escape by diving into a thick tree-top where he can turn and drive off the little terrors. Western Red-tail Hawks are often attacked by the nutcracker; but at times he will find a Swainson Hawk, a very inoffensive hawk in the Yellowstone, and usually the nutcracker contents himself with only a peck or two at *him*.

Nutcrackers combine in themselves the peculiar habits of woodpeckers, crows, and jays. Almost every time one sees these birds he finds them doing something either new in itself or done in a new way. They will hammer on a limb and even jab their bills into crevices in the bark after insects in true woodpecker fashion. During the breeding season the nutcrackers are exceedingly quiet; that is, quiet for nutcrackers, but at all other times they are as vociferous, and as big scolds, as the blue jays of the East. They are wild, restless, and noisy; and they have a whole series of cries and squawks, most of them shrill and strident; their favorite is a rattling "*kar-r-r-r-ack, kar-r-r-r-ack*". At times they seem to become confidential and then they sput-

ter out a whole conversation in low tones. When on the way, going somewhere, the flight is strong, steady, and even; but when the journey is over, the wings are shut and the bird plunges forward in one long swoop, opening his wings and sweeping up to his perch. While descending from a height the nutcrackers pitch down either in one long swoop, opening their wings with an audible, explosive burst, and curving up to the landing places; or they will take a series of such plunges. When crossing between two nearby groves, they do it in long, undulating swoops. They are given to perching at the tip of some tall pine that is itself at the top of a mountain, or on some commanding position where the country can be surveyed for miles in every direction. When they drink they turn the head sideways and drink through the side of the long bill. They can be tamed and kept about the house, becoming as impudent and mischievous as crows.

Nutcrackers have their own way of building their nests. Just think of birds that build their nests in February and bring forth their naked young in March, long before the snow has left the ground! These birds are so secretive about their nest that they make a series of stops fifty feet apart and survey the country carefully from each stop. About February 1, at Fort Yellowstone, elevation 6300 feet above sea level, the birds are mated and the building of the nest begins, each bird of the pair doing its share. The thick top of a cedar, or other evergreen, is selected, with a convenient crotch about twelve feet from the ground. First a rough platform of twigs is built. These twigs are broken from a cedar (western juniper) by a quick, wrenching jerk assisted by the cutting edges of the bill, and carried to the site. Here the material is piled in the crotch till the mass reaches a ball about nine inches in diameter and six inches high. The nest proper is deep and cup shaped, about six inches in diameter, and has walls an inch thick; it is built of cedar or pine needles and the inner lining of grass stems and shredded juniper bark, each strand turned into place by the bird squatting down on it and twisting it in. A few horse hairs and bits of string are usually included in the lining. Four gray-green eggs, with irregular, gray-brown markings are laid between February 28 and March 3, and the brooding commences immediately. At such a time the brooding bird is subjected to all the vagaries of truly wintry weather. Often she sits through raging snowstorms protected only by the tuft of cedar needles over the nest, and many times has the writer seen the bird actually on the nest with the thermometer below zero. Under such conditions she draws herself down with only her tail feathers and perhaps her bill showing above the rim of the nest. She is very fearless, even submitting to capture rather than leave the nest; when she leaves, she does so quietly, and returns immediately after the intruder is gone. After brooding twenty-two days the young are hatched, naked of course, and with their eyes closed. Four weeks later the young leave the nest and by May 5 are fully feathered and shifting for themselves. Notwithstanding this early start there is no evidence to show that a second brood is raised. At higher altitudes the nesting is somewhat later, but at that it is safe to say that the latest of the young birds are able to care for themselves before the end of May.

Summerville, South Carolina, January 27, 1916.